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Phenolipids as antioxidant in omega-3 enriched food products

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Foods containing omega-3 PUFA are highly susceptible to oxidation. This causes formation of undesirable flavors and loss of health-beneficial fatty acids. To protect these food products, antioxidant addition may be a solution. Lately, extensive work has been performed on phenolipids and their efficacy in model emulsion systems. Since the polar paradox hypothesis was a simplified statement of the antioxidant efficacy in emulsions, a new term, "cut-off effect", was introduced. The cut-off effect describes the efficacy of phenolipids in simple emulsions. However, most food products consist of a complex matrix where several factors may influence the oxidative stability, e.g. type and concentration of emulsifier. Thus, a better understanding of the antioxidative effect of phenolipids in complex foods is of great interest.

The aim of this study was to evaluate the antioxidative effect of caffeic acid and its esters, caffeates, in two different fish-oil-enriched food products: mayonnaise and milk. Lipid oxidation was evaluated from 3 parameters measured over storage time: peroxide value, volatiles and tocopherol concentrations. The results demonstrate the influence of the complex emulsions on the antioxidant efficacy.